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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.11/KRIDL/CEMENT/2014-15

Date: 21.07.2014

TEST REPORT

CLIENT	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
NAME OF THE WORK	:	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
SAMPLE ID	:	Cement
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-1989
1	a) Initial Setting Time	IS-4031 (Part -5)	145 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	490 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	26.50 %	-

Note:

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SAND/2013-14 : 21.07.2014

TEST REPORT ON FINE AGGREGATES (SAND)
IS 383-1970 (RA- 2002)

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014

Date of Testing : 21.07.2014

Material : Sand Total Wt. of Aggregates in gms **2000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	98	4.90	4.90	95.1	90-100
2.36	198	9.90	14.80	85.2	75-100
1.18	512	25.60	40.40	59.6	55-90
600 Micron	416	20.80	61.20	38.8	35-59
300 Micron	498	24.90	86.10	13.9	8-30
150 Micron	215	10.75	96.85	3.2	0-10

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Job No.: CTCE/BBMP/W.No.11/KRIDL/AGG/2013-14 : 21.07.2014

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014

Date of Testing : 21.07.2014

Material : 40mm Aggregates

Total Wt. of Aggregates in gms **26000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
80	0	0	0	100	100
40	1030	3.96	3.96	96.04	95-100
20	16855	64.83	68.79	31.21	30-70
10	5120	19.69	88.48	11.52	10-35
4.75	2535	9.75	98.23	1.77	

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Job No.: CTCE/BBMP/W.No.11/KRIDL /STEEL/2014-15 21.07.2014

TEST REPORT ON REINFORCEMENT STEEL

Client	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	:	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	:	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Date of Test	:	21.07.2014
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	12	0.89	515	550	13.15	O.K	O.K

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Job No.: CTCE/BBMP/W.No.11/KRIDL/CUBE/2014-15 30.07.2014

TEST REPORT ON CONCRETE CUBES

Client	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of the work	: Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Sample ID	: Drain Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7^{th} day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	23.07.2014	30.07.2014	8.462	378.8	16.84
2	23.07.2014	30.07.2014	8.265	358.3	15.92
3	23.07.2014	30.07.2014	8.389	369.7	16.43

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Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/Gradation/2014-15

03.11.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014

Date of Testing : 03.11.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **25335**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	825	825	3.3	96.7	95-100
22.4	5290	6115	24.1	75.9	60-80
11.2	5510	11625	45.9	54.1	40-60
4.75	4310	15935	62.9	37.1	25-40
2.36	3850	19785	78.1	21.9	15-30
0.600	2610	22395	88.4	11.6	8-22
0.075	2590	24985	98.6	1.4	0-8

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GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

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Name of Work : Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014

Date of Testing : 03.11.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **25255**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	910	910	3.6	96.4	95-100
22.4	5250	6160	24.4	75.6	60-80
11.2	5610	11770	46.6	53.4	40-60
4.75	4215	15985	63.3	36.7	25-40
2.36	3680	19665	77.9	22.1	15-30
0.600	2510	22175	87.8	12.2	8-22
0.075	2690	24865	98.5	1.5	0-8

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Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/AIV/2014-15

03.11.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	03.11.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	303	
4	Aggregate Impact value = percent fines	22.11	22.31	
	100* (W_2/W_1)%			**22.21**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/S-T/2014-15 03.11.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager**, KRIDL, Bangalore.
Name of Work	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	03.11.2014

Result : Flakiness Index = **11.25%**

Elongation Index = **13.65%**

Result : Combined Flakiness & Elongation index **24.90%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Bitumen/2014-15 . 05.10.2014

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
SAMPLE I/D	Roads in Vinayaka Layout ward No.11, BBMP, Bangalore.
DATE OF TESTING	05.10.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.65	6.87	6.87	93.13	90-100
4.75	243.6	51.28	58.16	41.84	35-51
2.36	36.25	7.63	65.79	34.21	24-39
1.18	40.22	8.47	74.26	25.74	15-30
0.3	42.32	8.91	83.17	16.83	9-19
0.075	53.36	11.23	94.40	5.60	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	30.29	6.06	6.06	93.94	90-100
4.75	259.8	51.96	58.02	41.98	35-51
2.36	55.65	11.13	69.15	30.85	24-39
1.18	45.32	9.06	78.21	21.79	15-30
0.3	36.32	7.26	85.48	14.52	9-19
0.075	39.65	7.93	93.41	6.59	3-8

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/AIV/2014-15 10.11.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
28.07.2014	10.11.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	390	392	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	89	90	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.82	22.96	22.89

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Shape_T/2014-15 :.10.11.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Work	: Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 10.11.2014

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **11.59%**

Elongation Index = **13.26%**

Result : Combined Flakiness & Elongation index 24.85%

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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ವಿದ್ಯಾರಣ್ಯಪುರ ಉಪ ವಿಭಾಗ
ಯಲಹಂಕ ವಲಯ,
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Building & Highway Material Testing Laboratory

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Stripping/2014-15 10.11.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	10.11.2014

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.40	96.60
2	3.5		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

Note:

Þ This test report should not be reproduced except in full, without written approval of the laboratory

Þ The results indicated above are based on the tests carried out on the samples received in the laboratory

Þ Any Query regarding the report must be reported within 30 days from the date of testing.

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ವಿದ್ಯಾರಣ್ಯಪುರ ಉಪ ವಿಭಾಗ
ಯಲಹಂಕ ವಲಯ,
ಬೃ ಬೆಂ. ಮ. ಪಾ., ಬೆಂಗಳೂರು-97.

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Sp_Wa/2014-15 10.11.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Roads, Construction of Culverts and Asphalting to Vinayaka Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/5/2014-15 Dated: 19.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	10.11.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2023	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1267	1268	
4	Weight of saturated surface dry aggregate in air	W_3 g	2018	2019	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	753	752	752	
6	Weight of oven dried aggregate	W_4 g	2010	2005	2008	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.669	2.666	2.670	2.669
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.698	2.717	2.714	2.709
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.40%	0.70%	0.60%	0.56%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

Note:

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